

What is claimed is:

1. A method for recording and reproducing a data into and from an optical recording medium, comprising the steps of:

5 reading blocks having a predetermined size of byte unit arranged in a pre-set number of rows and columns in an optical recording medium in a zigzag direction and rearranging the read blocks;

recording the rearranged data in the optical recording medium;

reading the data recorded in the optical recording medium; and

10 reproducing the read data.

2. The method of claim 1, wherein, in the rearranging step, columns and rows of the blocks are scanned zigzag in a diagonal direction and the resulting blocks are rearranged in a row.

15 3. The method of claim 1, wherein the data to be recorded contains a synchronous signal and a modulated data.

4. The method of claim 3, wherein the modulated data is formed by  
20 an EFM plus modulation method.

5. The method of claim 3, wherein the modulated data contains a scrambled data and an error correction code.

25 6. The method of claim 5, wherein the scrambled data contains a

user data and information on a collection of data blocks.

7. An apparatus for recording and reproducing a data into and from an optical recording medium using a zigzag scan, comprising:

5 a data processor generating a data to be recorded in an optical recording medium from a user data, and reproducing the user data from a data read from the optical recording medium;

10 a rearranging unit generating a rearranged data from the data outputted from the data processor, and generating a data before the data rearrangement from the rearranged data; and

15 a recording and reproducing unit recording the data outputted from the rearranging unit in the optical recording medium, and reproducing the data recorded in the optical recording medium to output it to the rearranging unit.

15 8. The apparatus of claim 7, wherein the data processor comprises:  
a scramble and ECC adding unit for scrambling the user data, inserting an error correction code and generating a first data sector;

20 a modulator for modulating the first sector; and  
a synchronous signal inserting unit for inserting a synchronous signal into the modulated data and generating a data to be recorded in the optical recording medium.

25 9. The apparatus of claim 7, wherein the data processor comprises:  
a demodulator for detecting the synchronous signal from the data outputted from the rearranging unit and generating a demodulation signal ; and

a descramble and ECC detecting unit for descrambling the demodulated signal, detecting an error correction code, and generating its original user data.

10. The apparatus of claim 7, wherein, in the rearranging unit, the  
5 data outputted from the data processor is scanned zigzag in a diagonal direction.

11. A method for recording a data into an optical recording medium in which a data to be recorded in an optical recording medium is modulated and a synchronous signal is inserted into the modulated data, comprising the steps of:

10 scanning a data zigzag so that the data with the synchronous inserted into  
can be dispersed in a track traverse direction of the optical recording medium; and  
recording the zigzag-scanned data in the optical recording medium.

15. The method of claim 11, wherein the data with the synchronous  
15 signal inserted thereto is classified into a synchronous data and a main data, and  
only the main data is scanned zigzag.

13. The method of claim 11, wherein the rearranged data by zigzag  
scanning is sequentially recorded in the optical recording medium.

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14. An optical recording medium data reproducing method in which a  
data is recorded to be distributed in a traverse direction of a track in an optical  
recording medium and scanned zigzag, and the recorded data is reproduced,  
comprising the steps of:

25 reading a data recorded in the optical medium;

arranging the read data in the reverse order of the zigzag scan; and  
reading the reversely arranged data.

15. An apparatus for recording a data in an optical recording medium  
5 using a zigzag scan, comprising:

a data sector;

a scramble/error correction code adding unit scrambling the data sector  
and adding an error correction code to generate a record sector;

a modulator modulating a record sector;

10 a synchronous signal inserting unit inserting a synchronous signal into the  
modulated data to generate a physical sector;

a zigzag scanning unit scanning the physical sector zigzag so as to be  
dispersed in a track traverse direction of the optical recording medium and  
rearranging the scanned data; and

15 a recording unit recording the rearranged data in the optical recording  
medium.

16. The apparatus of claim 15, wherein the rearranged data is  
sequentially recorded in the optical recording medium.

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17. An optical recording medium data reproducing using a zigzag  
scan in which a data recorded as being scanned zigzag so that a data to be  
recorded in an optical recording medium is dispersed in a traverse direction of a  
track is reproduced, comprising:

25 a reproducing unit reading a data recorded in the optical recording

medium; and

a scan unit scanning the data read from the reproducing unit in the reverse order of the zigzag scan.